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| 10/709,518 | 05/11/2004 | Krishna G. Sachdev | FIS920030420US1 | 3517 |
| 32074 7590 05/21/2007 INTERNATIONAL BUSINESS MACHINES CORPORATION DEPT. 18G BLDG. 300-482 2070 ROUTE 52 HOPEWELL JUNCTION, NY 12533 | | | EXAMINER FEELY, MICHAEL J | |
| | | | ART UNIT 1712 | PAPER NUMBER |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/709,518

Applicant(s)

SACHDEV ET AL.

Examiner

Michael J. Feely

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 March 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-15,17-19,26-33 and 35 is/are pending in the application.
- 4a) Of the above claim(s) 26-33 and 35 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-15,17 and 18 is/are rejected.
- 7) ☒ Claim(s) 1,3-15 and 17-19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 May 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Pending Claims

Claims 1, 3-15, 17-19, 26-33, and 35 are pending.

Claims 26-33 and 35 are withdrawn from consideration.

Response to Amendment

1. The rejection of claims 3, 4, 9, and 13, under 35 U.S.C. 112, second paragraph, has been overcome by amendment.
2. The rejection of claims 20-25, under 35 U.S.C. 112, second paragraph, has been rendered moot by the cancellation of these claims.
3. The rejection of claims 2 and 16 under 35 U.S.C. 102(b) as being anticipated by Sachdev et al. (US Pat. No. 5,700,581) has been rendered moot by the cancellation of these claims.
4. The rejection of claims 2 and 16 under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Sachdev et al. (US Pat. No. 6,548,175) has been rendered moot by the cancellation of these claims.
5. The rejection of claim 19 under 35 U.S.C. 103(a) as being unpatentable over Sachdev et al. (US Pat. No. 5,700,581) has been overcome by amendment.
6. The rejection of claims 20-25 under 35 U.S.C. 103(a) as being unpatentable over Sachdev et al. (US Pat. No. 5,700,581) has been rendered moot by the cancellation of these claims.
7. The rejection of claim 19 under 35 U.S.C. 103(a) as being unpatentable over Sachdev et al. (US Pat. No. 6,548,175) has been overcome by amendment.

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8. The rejection of claims 20-25 under 35 U.S.C. 103(a) as being unpatentable over Sachdev et al. (US Pat. No. 6,548,175) has been rendered moot by the cancellation of these claims.

9. The rejection of claim 34 under 35 U.S.C. 103(a) as being unpatentable over Sachdev et al. (US Pat. No. 5,700,581 or US Pat. No. 6,548,175) in view of Buchwalter et al. (US 2002/0171132) has been rendered moot by the cancellation of this claim.

10. The rejection of claim 19 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-22 of U.S. Patent No. 5,700,581 has been overcome by amendment.

11. The rejection of claims 2, 16, and 20-25 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-22 of U.S. Patent No. 5,700,581 has been rendered moot by the cancellation of these claims.

12. The rejection of claim 19 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-15 of U.S. Patent No. 6,548,175 has been overcome by amendment.

13. The rejection of claims 2, 16, and 20-25 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-15 of U.S. Patent No. 6,548,175 has been rendered moot by the cancellation of these claims.

14. The rejection of claim 34 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-22 of U.S. Patent No. 5,700,581 or over claims 1-15 of US Patent No. 6,548,175 in view of Buchwalter et al. (US 2002/0171132) has been rendered moot by the cancellation of this claim.

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Claim Objections

15. Claims 1, 3-15, and 17-19 are objected to because of the following informalities:

In the polymer additive Markush group of claim 1, it appears that some commas and semicolons are not placed properly. The list should be rewritten as: --said polymer additive is selected from the group consisting of: poly(n-butylacrylate); poly(n-butylmethacrylate); poly(n-fluorobutyl methacrylate); poly(methyl methacrylate); oligomeric ABA-glycidyl methacrylate diester; oligomeric amine-terminated poly(acrylonitrile-co-butadiene); and mixtures thereof.-- (see paragraphs 0052-0053 of the specification). Claims 3-15, 17, and 18 are objected to because they are dependent from claim 1.

In claim 19, "poly (ABA-glycidyl methacrylate oligomer)" should be replaced with --oligomeric ABA-glycidyl methacrylate diester--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

16. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

17. The rejection of claims 1, 3, 6, 7, 14, 15, 17, and 18 under 35 U.S.C. 102(b) as being anticipated by Sachdev et al. (US Pat. No. 5,700,581) stands.

Regarding claims 1, 3, 6, 7, 14, 15, 17, and 18, Sachdev et al. disclose: (1) a re-workable conductive adhesive composition (Abstract; claims) comprising an epoxy based conductive adhesive (Abstract; claims) containing conductive metal filler particles (Abstract; claims column

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6, lines 13-22) dispersed in a solvent-free hybrid epoxy polymer matrix (Abstract; claims), wherein:

said solvent-free hybrid epoxy polymer matrix comprises a liquid epoxy precursor having a siloxane linkage and carrying an acyclic or alicyclic chain segment (Abstract; claims; column 5, lines 10-41), a solid or liquid anhydride or an amine curing additive (Abstract; claims; column 5, lines 42-63), an epoxy curing catalyst (Abstract; claims; column 6, lines 5-12), and a polymer additive completely miscible in said epoxy precursor (Abstract; claims, column 5, line 64 through column 6, line 4);

wherein said polymer additive is selected from the group consisting of *see claim for list* (Abstract; claims; column 5, line 64 through column 6, line 4);

(14) wherein said liquid precursor is selected from the group consisting of *see claim for list* (Abstract; claims; column 5, lines 10-41); (15) wherein said anhydride curing additive is selected from the group consisting of *see claim for list* (Abstract; claims); (18) wherein said epoxy curing catalyst is selected from the group consisting of *see claim for list* (Abstract; claims; column 6, lines 5-12);

(3) wherein said metal filler particles are selected from the group consisting of Pd-coated Ag, Au coated Ag, Ag, Ag coated Cu, spherical Ag powder, carbon fibers, and carbon micro-fibers (column 6, lines 12-22); (17) wherein said metal filler particle size is less than 10 microns (column 6, lines 12-22);

(6) wherein said metal filler particles are metal flakes (column 6, lines 12-22); and (7) wherein said metal filler particles are metal powder (column 6, lines 12-22).

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Claim Rejections - 35 USC § 102/103

18. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

19. The rejection of claims 1, 3, 6, 7, 14, 15, 17, and 18 under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Sachdev et al. (US Pat. No. 6,548,175) stands.

Regarding claims 1, 3, 6, 7, 14, 15, 17, and 18, Sachdev et al. disclose: *(1)* a conductive adhesive composition (Abstract; claims) comprising an epoxy based conductive adhesive (Abstract; claims; column 5, line 45 through column 6, line 2) containing conductive metal filler particles (Abstract; claims; column 7, lines 1-22) dispersed in a solvent-free hybrid epoxy polymer matrix (Abstract; claims), wherein:

said solvent-free hybrid epoxy polymer matrix comprises a liquid epoxy precursor having a siloxane linkage and carrying an acyclic or alicyclic chain segment (Abstract; claims; column 5, line 45 through column 6, line 2), a solid or liquid anhydride or an amine curing additive (Abstract; claims; column 6, lines 13-32), an epoxy curing catalyst (Abstract; claims; 33-48), and a polymer additive completely miscible in said epoxy precursor (Abstract; claims; column 6, lines 49-67);

wherein said polymer additive is selected from the group consisting of *see claim for list* (Abstract; claims; column 6, lines 49-67);

(14) wherein said liquid precursor is selected from the group consisting of *see claim for list* (Abstract; claims; column 5, line 45 through column 6, line 2); *(15)* wherein said anhydride curing additive is selected from the group consisting of *see claim for list* (Abstract; claims;

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column 6, lines 13-32); (18) wherein said epoxy curing catalyst is selected from the group consisting of *see claim for list* (Abstract; claims; column 6, lines 33-48);

(3) wherein said metal filler particles are selected from the group consisting of Pd-coated Ag, Au coated Ag, Ag, Ag coated Cu, spherical Ag powder, carbon fibers, and carbon micro-fibers (column 7, lines 1-22); (17) wherein said metal filler particle size is less than 10 microns (column 7, lines 1-22);

(6) wherein said metal filler particles are metal flakes (column 7, lines 1-22); (7) wherein said metal filler particles are metal powder (column 7, lines 1-22)

Sachdev et al. do not explicitly disclose that their composition is re-workable; however, this appears to be an inherent property because Sachdev et al. satisfy all of the material and chemical limitations set forth in the claims. It has been found that, "Products of identical chemical composition can not have mutually exclusive properties." A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present – *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Therefore, the composition of Sachdev et al. would have been inherently re-workable because Sachdev et al. satisfy all of the material and chemical limitations set forth in the claims.

Claim Rejections - 35 USC § 103

20. The rejection of claims 4, 5, 8, 12, and 13 under 35 U.S.C. 103(a) as being unpatentable over Sachdev et al. (US Pat. No. 5,700,581) stands.

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Regarding claims 4, 5, 8, 12, and 13, Sachdev et al. disclose, "A preferred electrically conductive filler is Ag flakes having less than about 10 micron average size, although up to about 30 microns may be used or higher. Other fillers that can also be used are Ag powder, Au, Ni, Cu, silica, alumina, aluminum nitride, or a ceramic filler. Amounts up to about 80% or higher by weight of the total formulation may be employed with preferred amounts of 60% to 80% being typically employed," (column 6, lines 12-22). This passage covers all of the individual materials and amounts set forth in the instant claims; however, these teachings do not explicitly set forth combinations of fillers.

It should be noted that Sachdev et al. essentially present these fillers as functional equivalents. In light of this, it has been found that, "It is *prima facie* obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose.... [T]he idea of combining them flows logically from their having been individually taught in the prior art," – *In re Kerkhoven*, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the combination of materials, as set forth in claims 4, 5, 8, 12, and 13, in the composition of Sachdev et al. because Sachdev et al. presents these individual materials as functional equivalents.

21. The rejection of claim 8 under 35 U.S.C. 103(a) as being unpatentable over Sachdev et al. (US Pat. No. 6,548,175) stands.

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Regarding claim 8, Sachdev et al. disclose the use of metal flake or powder; however, they fail to explicitly disclose a combination of the two.

It should be noted that Sachdev et al. essentially present these fillers as functional equivalents. In light of this, it has been found that, "It is *prima facie* obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose.... [T]he idea of combining them flows logically from their having been individually taught in the prior art," – *In re Kerkhoven*, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the combination of materials, as set forth in claim 8, in the composition of Sachdev et al. because Sachdev et al. presents these individual materials as functional equivalents.

22. The rejection of claims 9-11 under 35 U.S.C. 103(a) as being unpatentable over Sachdev et al. (US Pat. No. 5,700,581 or US Pat. No. 6,548,175) in view of McArdle et al. (US Pat. No. 6,977,025) stands.

Regarding claim 9, the teachings of Sachdev et al. are as set forth above and incorporated herein. Sachdev et al. do not disclose the use of carbon micro-fibers in concert with their metal flakes or powders.

The teachings of McArdle et al. (*see column 31, line 18 through column 32, line 10*) demonstrate that carbon micro-fibers are recognized in the art as suitable conductive fillers for

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electronics applications. Furthermore, they are presented as equivalents to metal flake and powder (*see MPEP 2144.06 & 2144.07*)

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to additionally use carbon micro-fibers in the composition of Sachdev et al. because the teachings of McArdle et al. demonstrate that carbon micro-fibers are recognized in the art as suitable conductive fillers for electronics applications. Furthermore, they are presented as equivalents to metal flake and powder.

Regarding claims 10 and 11, Sachdev et al. do not disclose the use of metallic hollow spheres or metal fibers.

The teachings of McArdle et al. (*see column 31, line 18 through column 32, line 10*) demonstrate that these conductive fillers are recognized in the art as suitable conductive fillers for electronics applications. Furthermore, they are presented as equivalents to metal flake and powder (*see MPEP 2144.06 & 2144.07*)

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to additionally use metallic hollow spheres or metal fibers in the composition of Sachdev et al. because the teachings of McArdle et al. demonstrate that conductive fillers are recognized in the art as suitable conductive fillers for electronics applications. Furthermore, they are presented as equivalents to metal flake and powder.

Double Patenting

23. The rejection of claims 1, 14, and 15 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-22 of U.S. Patent No. 5,700,581 stands.

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Although the conflicting claims are not identical, they are not patentably distinct from each other because: the patented claims anticipate instant claims 1, 14, and 15 for the reasons set forth above in section 17.

24. The rejection of claims 3-8, 12, 13, 17, and 18 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-22 of U.S. Patent No. 5,700,581, in light of the specification (*see In re Vogel*, 422 F.2d 438, 441-42, 164 USPQ 619, 622 (CCPA 1970)) stands. Although the conflicting claims are not identical, they are not patentably distinct from each other because: the patented claims, in light of the specification, anticipate instant claims 3, 6, 7, 17, and 18 for the reasons set forth above in section 17; and the patented claims, in light of the specification, obviously satisfy claims 4, 5, 8, 12, and 13 for the reasons set forth above in section 20.

25. The rejection of claims 1, 14, and 15 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-15 of U.S. Patent No. 6,548,175 stands. Although the conflicting claims are not identical, they are not patentably distinct from each other because: the patented claims inherently satisfy instant claims 1, 14, and 15 for the reasons set forth above in section 8; and the patented claims obviously satisfy instant claim 19 for the reasons set forth above in section 19.

26. The rejection of claims 3, 6-8, 17, and 18 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-15 of U.S. Patent No. 6,548,175, in light of the specification (*see In re Vogel*, 422 F.2d 438, 441-42, 164 USPQ 619, 622 (CCPA 1970)) stands. Although the conflicting claims are not identical, they are not patentably distinct from each other because: the patented claims, in light of the specification, inherently satisfy instant

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claims 3, 6, 7, 17, and 18 for the reasons set forth above in section 19; and the patent claims, in light of the specification, obviously satisfy claim 8 for the reasons set forth above in section 21.

27. The rejection of claims 9-11 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-22 of U.S. Patent No. 5,700,581 or over claims 1-15 of US Patent No. 6,548,175, in light of the specifications (*see In re Vogel*, 422 F.2d 438, 441-42, 164 USPQ 619, 622 (CCPA 1970)) and in view of McArdle et al. (US Pat. No. 6,977,025) stands. The instant claims are obvious for the reasons set forth above in section 22.

Response to Arguments

28. Applicant's arguments filed March 20, 2007 have been fully considered but they are not persuasive.

Regarding independent claim 1, Applicant has expanded the list of candidate polymer additives to include:

- oligomeric ABA-glycidyl methacrylate diester; and
- oligomeric amine-terminated poly(acrylonitrile-co-butadiene);

along with:

- poly(n-butylacrylate);
- poly(n-butylmethacrylate);
- poly(n-fluorobutyl methacrylate);
- poly(methyl methacrylate);
- and mixtures thereof.

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Applicant contends that the prior art does not apply because they do not disclose each and every aspect of the claimed invention. In other words, Applicant contends that the prior art does not apply because they do not disclose every member of the Markush group.

Applicant is reminded that a Markush group is a means of claiming alternative embodiments, wherein a species is "*selected from the group consisting of*". The prior art is applied when *at least one* member of the Markush group is disclosed. The prior art need not disclose every member of the Markush group in order to anticipate or render obvious the claimed subject matter. The Sachdev et al. references disclose: poly(n-butylacrylate), poly(n-butylmethacrylate), poly(n-fluorobutyl methacrylate), poly(methyl methacrylate), and mixtures thereof ('581: column 5, line 64 through column 6, line 4; '175: column 6, lines 49-58). Hence, they satisfy the claim limitation.

Allowable Subject Matter

29. Claim 19 would be allowable if rewritten to overcome the claim objections.

30. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record fails to teach or suggest the method of claim 19, wherein the composition features a polymer additive of: oligomeric ABA-glycidyl methacrylate diester.

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Conclusion

31. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

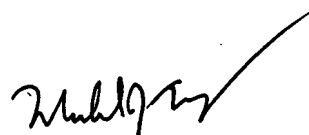
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Communication

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J. Feely whose telephone number is 571-272-1086. The examiner can normally be reached on M-F 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Michael J. Feely
Primary Examiner
Art Unit 1712

May 17, 2007

**MICHAEL FEELY
PRIMARY EXAMINER**